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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/018,116	04/19/2002	Lutz Fabian	EF377397961US	1556

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BAKER & BOTTS L.L.P.
30 ROCKEFELLER PLAZA
44TH FLOOR
NEW YORK, NY 10112-4498

EXAMINER	
DUONG, THANH P	
ART UNIT	**PAPER NUMBER**
1764	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/018,116	FABIAN ET AL.	
	Examiner	Art Unit	
	Tom P. Duong	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 18, 2006 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 20-39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claim 20 and 39, there is no written description of "a reaction chamber for removing harmful and/or toxic gases" as filed on April 19, 2002.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 20-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation of "a reaction chamber for removing harmful and/or toxic gases" is indefinite and inaccurate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 20-31 and 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barton '877 in view of Carr et al. (5,011, 520). Regarding claims 20-21 and 39, Barton discloses a waste gas cleaning system for removing harmful and/or toxic gases from a gas stream (Fig. 1), comprising: a reaction chamber (14) for removing harmful and/or toxic gases (best understood by Examiner that the spray nozzles 94 creates a negative pressure in the reaction chamber 14) having an inlet (60) for receiving a gas stream to be treated and an outlet (90); a plasma source (12) coupled to said reaction chamber (14) for providing excitation energy (Col. 3 lines 20-26) to said chamber (best understood by Examiner that the spray nozzles 94 create a negative pressure in the reaction chamber (14) and form a plasma therein; and a liquid jet pump (94) having a suction tube or port (90) arranged at said reaction chamber

outlet (90) and generating negative pressure (Col. 6, lines 31-37) in said reaction chamber (14) for generating a plasma therein. With respect to the liquid jet pump, Barton discloses the spray nozzles (94), which contains spray ring 16, which is connected to the reaction vessel outlet port 90, and connected to reservoir 98 of high pressure quench water (Col. 5, lines 15-45). The spray nozzles (94) appear to constitute a liquid jet pump of the claimed invention being the fact that the spray nozzles (94) spray the scrubbing liquid at a high pressure which draws and mixes the gas and scrubbing liquid and thereby, creates a negative pressure in the reaction chamber (Col. 5, lines 15-60). Barton discloses a liquid jet pump but is silent with respect to a liquid jet pump has a "constricted region" having a lower pressure that is connected via said suction tube or port to said reaction chamber to provide a vacuum drawing power or suction on said reaction chamber. Carr teaches that the spray nozzles 86, together with the flow constriction 90 (constricted region), is adjusted to create suction sufficient to draw the gaseous effluent into the main scrubbing chamber 22 and simultaneously intimately to mix the effluent with the scrubbing liquid (Col. 8, lines 28-43 and Figure 5). The inside surface 90 of the structure 84 converges to form a venturi or "constricted region" of the claimed invention. Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the apparatus of Barton with a liquid jet pump with a constricted region as taught by Carr in order to promote intermixing between the gas and scrubbing liquid and maintain a negative pressure in the scrubber system. Regarding claim 22, the above references fail to disclose the specific negative pressure range of the claimed invention, however, the applied references disclose the

features of the claimed invention and it would have been *prima facie* obviousness to optimize the scrubbing system to obtain such negative pressure at most thru routine experimentation. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Regarding claim 23, Barton discloses the liquid jet pump is provided with a sorption medium (110). Regarding claims 24-26 and 37, Barton fails to disclose a recirculation system including said liquid jet for said sorption medium. Carr teaches a recirculation system consisting of a circulation pump 100 and recirculation tank 218 with coolant coils (Col. 13, lines 35-38) and control panel 224 to control the recirculation flow rate (Col. 13, lines 45-52) and a reservoir having neutralized agent (Col. 13, lines 52-54) to prevent build up in the system and further facilitating self-cleaning of the gas in the scrubber (Col. 4, lines 34-41). Thus, it would have been obvious in view of Carr to one having ordinary skill in the art to modify the scrubbing system of Barton with a recirculation system as taught by Carr in order to control the build up in the system and facilitating self-cleaning of the gas scrubber. Regarding claim 27, it is conventional to provide a circulation pump with a compressed air-driven diaphragm pump in the scrubbing system and it would have been obvious to do so here due to its low maintenance and reliability. Regarding claim 28, Barton discloses a secondary air inlet (via line 44), which appears to contribute to the negative pressure in the reaction chamber. Regarding claim 29, Barton discloses an additional gas (via line 70) to the reaction burner 12 to facilitate the combustion process. Regarding claims 30-31, it is conventional to provide additional gas such as hydrogen, oxygen, and water vapor the reaction chamber and it would have been obvious to do so here to facilitate the

oxidation and/or decomposition process. Regarding claim 36, Barton discloses the output of the pump 112 is control by a pH sensor and control is connected to the metering pump to provide alkaline material to the quench water (Col. 5, lines 46-63). Regarding claim 38, Barton discloses the suction line includes at least one aerosol filter (24).

2. Claims 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applied references (Barton '877 in view of Carr et al. '520) and further in view of Wofford et al. (5,750,823). The applied references disclose the plasma source but is silent with respect to a non-thermal plasma source with excitation energy in the microwave range of the claimed invention. Wofford teaches the waste gas is exposed in a non-thermal plasma (Abstract) with microwave energy (Col. 3, lines 5-10) having the microwave range (Col. 5, lines 1-10) of the claimed invention and the use of a non-thermal plasma provide the advantages of reduced energy consumption and more easily removed by-products (Col. 1, lines 4-67 and Col. 2 lines 1-15). Thus, it would have been obvious in view of Wofford to one having ordinary skill in the art to modify the apparatus of the applied references with a non-thermal plasma source as taught by Wofford in order to gain the above advantages.

Response to Arguments

Applicants' arguments filed December 18, 2006 have been fully considered but they are not persuasive. (1) Applicants argue "the Examiner mistakenly corresponds Carr's reaction

process 12 with "a reaction chamber," and in particular with "a reaction chamber for removing harmful and/or toxic gases" as required by applicants' claims 20 and 39. Carr's reaction process 12 is the source of a waste gas stream which needs to be cleaned and not a waste cleaning system reaction chamber (See e.g., Carr col. 5 lines 40-43 "reaction process 12 generates and emits a gaseous effluent stream which is heavily laden with siliceous particulates.") Examiner agrees that the Carr's reaction chamber is not a reaction chamber; however, Barton discloses all the features of the claimed invention including the reaction chamber (14) and a liquid jet pump (94). The only missing feature in the Barton reference is a "constricted region" of a liquid jet pump. First, it is submitted that Barton reference discloses a liquid jet pump (94) but is silent with respect to a liquid jet pump has a "constricted region" as claimed. Carr teaching reference is used to show the advantage of having a liquid jet pump with a "constricted region" to create a negative pressure in the system. Second, there is no written description of "a reaction chamber for removing harmful and/or toxic gases" as originally filed on April 19, 2002. It is best understood that Carr teaches the liquid jet pump has a "constricted region" which sprays the scrubbing liquid at a high pressure and thereby, generate a negative pressure in the system to withdraw the harmful/and toxic gas into the scrubbing section for mixing the gas and the scrubbing liquid as described in paragraph 3. The liquid jet pump is no more than a spray nozzle (94) as evidenced by Barton and/or taught by spray nozzle 86 with a "constricted region 90" of Carr as shown in Figure 5.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P. Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Tom Duong
January 23, 2007

TD

Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700